

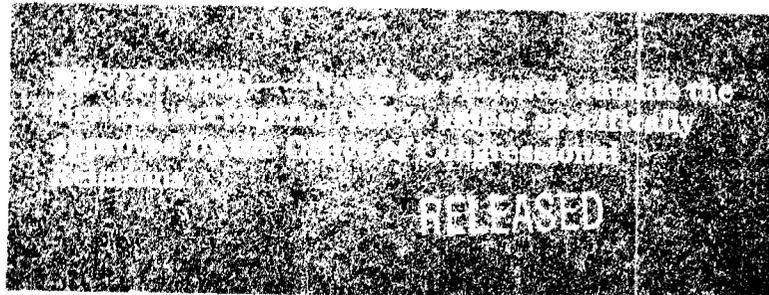
GAO

Report to the Honorable
John Conyers, Jr., Chairman, Legislation
and National Security Subcommittee,
Committee on Government Operations,
House of Representatives

April 1989

ADP ACQUISITION

Air Force Logistics System Modernization Projects





United States
General Accounting Office
Washington, D.C. 20548

Information Management and
Technology Division

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April 21, 1989

The Honorable John Conyers, Jr.
Chairman, Legislation and National
Security Subcommittee
Committee on Government Operations
House of Representatives

Dear Mr. Chairman:

As a result of your September 28, 1988, Subcommittee hearing on the Navy's Standard Automated Financial System, the former Subcommittee Chairman requested that we provide information on the cost of three Air Force systems: the Requirements Data Bank, the Contract Data Management System, and the Depot Maintenance Management Information System. The three Air Force systems were among seven automated information systems identified by the Office of the Secretary of Defense (OSD) as experiencing significant cost growth. In subsequent discussions, we agreed to provide for each system 1) a system description, including the acquisition approach being followed, 2) the current status of the system, 3) a description of the cost growth and a comparison with information submitted in budget requests, 4) reasons for cost growth, and 5) actions taken by the OSD and the Air Force to control costs. To expedite our reply, it was also agreed that we would not independently verify cost information and the reasons for cost growth identified by OSD and the Air Force.

The three Air Force systems are a part of the Air Force Logistics Management Systems Modernization Program. Established in the early 1980s, the program initially brought ten separate on-going logistics system modernization projects under the management of the Air Force Logistics Command. Nine projects now comprise the modernization program and each project is being developed individually. The modernization is expected to be completed by the end of 1994 and the cost for acquiring and making all nine systems fully operational is estimated to exceed \$1 billion; the three systems we reviewed represent over 50 percent of the expected cost. See appendixes for detailed information on each of the systems.

Requirements Data Bank

The primary objective of the Requirements Data Bank (RDB) project is to modernize the Air Force's automated and manual requirements functions and correct deficiencies in the requirements computation process.

The RDB system is being developed to compute the material quantities and budgets needed to support weapon systems and other equipment. This system is being designed to have the capability to simulate options or possible results through "what if" scenarios. These simulations are expected to provide Air Force managers with accurate readiness assessments. The project was conceptualized in the late 1970s and efforts to develop RDB began in August 1980. Although the project was planned for completion by April 1989, the Air Force now expects it to be completed in September 1994.

In September 1988, OSD reported to your Subcommittee that the RDB program cost estimate¹ had grown from \$140 million to \$248 million. According to Air Force project officials, these figures are not comparable. The \$140 million estimate, which was provided to OSD in 1984, only represented acquisition costs. The \$248 million estimate, provided to OSD in 1988, included acquisition costs as well as other development costs. According to Air Force project officials, the comparative acquisition cost figures, which should be used to determine the RDB cost increase, are \$140 million reported in 1984 and \$222 million in 1988. The officials said the \$248 million estimate included \$26 million for modifications and maintenance costs that were not included in the 1984 estimate. Air Force project officials attribute the RDB cost increase primarily to a lack of detailed requirements and a contract conversion from a cost-plus-award-fee to a fixed-price contract.

The RDB life cycle cost is estimated to be \$375.6 million in the President's Fiscal Year 1990/1991 Information Technology Budget Exhibit. To reflect more current estimates, however, the Air Force is revising the estimate.

Contracting Data Management System

The Contracting Data Management System (CDMS) is being developed to provide a data base management system to manage contracting information by weapon system, automate data input and contract preparation, and improve pricing capabilities. CDMS will provide primary support to and be implemented at Air Force Logistics Command Headquarters and the five Air Logistics Centers. The system is intended to interface with over 60 data processing systems within the Air Force and the Department of Defense. CDMS project officials expect that the system will be

¹OSD, in providing this cost information to the Subcommittee, noted that program costs are basically the costs to develop and fully deploy a system. Life cycle costs, which we also discuss in this report, include program costs and the cost to operate and maintain a system over its expected useful life.

fully operational by March 1994, more than 3 years later than initial Air Force estimates.

In September 1988, OSD reported to your Subcommittee that the CDMS cost estimate had grown from approximately \$34 million to \$74 million. According to project documents, the dollar amounts provided by OSD represent a November 1984 acquisition cost estimate of \$34.4 million and a February 1988 acquisition cost estimate of \$73.8 million. CDMS project officials and system justification documents attribute the cost increase to (1) the addition of on-going initiatives to the CDMS project in 1986 to consolidate development of acquisition related projects, and (2) the identification, through an Air Force information engineering study completed in 1988, of additional requirements. According to project documentation, the addition of the initiatives increased the initial acquisition cost estimate from \$34 million to \$47 million. The additional requirements and the associated extended development schedule increased the acquisition cost estimate to \$73.8 million.

CDMS life cycle cost estimates are being revised. Project officials told us the \$87.4 million life cycle cost estimate contained in the President's Information Technology Budget Exhibit for Fiscal Year 1990/1991 does not include costs to operate and maintain the system after it becomes fully operational.

Depot Maintenance Management Information System

The objective of the Depot Maintenance Management Information System (DMMS) is to improve the Air Force's depot management and maintenance functions, including scheduling, production, engineering planning, and quality assurance. The system is being developed in three phases. The first phase, designed to improve the management of maintenance inventory centers, was completed in July 1988. The second and third phases, designed to modernize the entire Air Force depot maintenance system, are scheduled to be fully operational at the Air Force Logistics Centers by September 1993.

In 1984, the Air Force estimated the DMMS acquisition cost at \$85 million. That estimate, as of December 1988, has increased to \$242 million. These figures are the same as those reported by OSD following the September 1988 hearing held by your Subcommittee. Air Force project officials attribute the cost growth to what they describe as poorly defined initial requirements and understated initial cost estimates.

The project's life cycle costs were reported to be \$273.3 million in the President's Information Technology Budget Exhibit for Fiscal Year 1990/1991. Air Force officials told us the estimate is being revised to reflect a more accurate and current life cycle cost estimate and is scheduled to be completed by mid-1989.

Air Force and Department of Defense Actions to Control Costs

The Air Force Logistics Management System Modernization Program and its individual system projects have been the subject of several Air Force and OSD management reviews. The Air Force Logistics Command has implemented a review and approval process for the development and acquisition of the projects through the Logistics Systems Acquisition Review Council. The Air Force also has scheduled the modernization projects for formal milestone reviews at major acquisition and programmatic decision points. The forum for these reviews is the Air Force Automated Information Systems Acquisition Review Council. The Air Force also prepares quarterly reports on the progress of the projects within the program. Since March 1985, the Air Force has published 16 logistics management systems quarterly progress reports.

The modernization program, initiated in the early 1980s, has been the subject of formal, periodic oversight reviews by the OSD Major Automated Information System Review Council (MAISRC). The OSD MAISRC serves as Defense's management oversight and decision-making body for general purpose major information systems and is charged with assessing major resource investments in these systems at critical points in their development. In its first review of the modernization program in November 1984, the OSD MAISRC assessed the readiness of Air Force planning to proceed with the program and determined that the concept development phase had been accomplished. At this time, the OSD MAISRC delegated the Air Force authority for approving the modernization program and the responsibility for reviewing and approving the progress of the individual projects within the modernization program. The Air Force was also directed to prepare and present semi-annual, in-process reviews to the MAISRC.

Following the July 1988 in-process review, the MAISRC noted a number of problems that appeared to be occurring with specific projects. The MAISRC expressed an overall concern that the Air Force Automated Information System Acquisition Review Council had not properly staffed and executed reviews and validations of the individual projects to ensure their success. The specific MAISRC guidance for the three systems we reviewed is discussed in the appendixes.

We performed our work from October 1988 to February 1989. Our objectives, scope, and methodology are discussed in appendix IV. We did not obtain official agency comments on this report, but we did obtain the views of responsible Department of Defense and Air Force officials during the course of our work and included their comments where appropriate.

As arranged with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution of it until 30 days from the date of this letter. At that time, copies of the report will be provided to the Secretary of Defense, the Secretary of the Air Force, the Chairmen, House and Senate Committees on Armed Services, and the Chairmen, House and Senate Committees on Appropriations. We will make copies available to other interested parties upon request.

Major contributors to this report are listed in appendix V.

Sincerely yours,



Ralph V. Carlone
Assistant Comptroller General

Contents

Letter		1
Appendix I		8
Requirements Data Bank	System Status	8
	Cost Increases	8
	Reasons for Increasing Cost Estimates	9
	Air Force and OSD Actions to Control Cost	9
Appendix II		10
Contracting Data Management System	System Status	11
	Cost Increases	11
	Reasons for Increasing Cost Estimates	11
	Air Force and OSD Actions to Control Cost	12
Appendix III		13
Depot Maintenance Management Information System	System Status	14
	Cost Increases	14
	Reasons for Increasing Cost Estimates	15
	Air Force and OSD Actions to Control Cost	15
Appendix IV		16
Objectives, Scope, and Methodology		
Appendix V		17
Major Contributors to This Report		

Abbreviations

CDMS	Contracting Data Management System
DMMIS	Depot Maintenance Management Information System
GAO	General Accounting Office
IMTEC	Information Management and Technology Division
MAISRC	Major Automated Information System Review Council
MRP II	Manufacturing Resource Planning
OSD	Office of the Secretary of Defense
RDB	Requirements Data Bank

Requirements Data Bank

Efforts to develop the Requirements Data Bank (RDB) system began in August 1980 when the Air Force awarded a contract for a feasibility study. According to a 1982 RDB acquisition plan, as a result of the contractor's initial systems analysis, it became apparent to the Air Force that because of the size and complexity of RDB, it was infeasible to develop the system all at once. The Air Force, therefore, restructured the contract requiring an overall plan to describe an evolutionary definition and development approach for RDB. In early 1987 the Air Force adopted its current evolutionary development strategy that segments RDB into small manageable parts. In July 1988, the original cost-plus-award-fee contract was negotiated to a fixed-price contract to reflect the current development strategy.

System Status

In October 1988, an Air Force RDB decision paper characterized the status of the project as, "an evolutionary software development project which has reached a point in its development where the end result is definable with reasonable accuracy." Air Force estimates total RDB program costs at \$248.8 million and scheduled completion in September 1994. This completion date is 5 years later than a 1985 Air Force estimate that the project would be fully operational in April 1989. At the end of fiscal year 1988, the Air Force had obligated \$125.1 million for RDB and considered the project to be 32 percent operational. The operational capability that has been achieved is an on-line expense item data bank that reached initial operational capability in August 1985 and a programming, planning, and budgeting model for aircraft replenishment spares that was accepted in December 1987.

Cost Increases

After the September 1988 Subcommittee hearing, OSD reported that the RDB cost estimate had increased from \$140 million to \$248 million. According to Air Force project officials, these figures are not comparable. The \$140 million estimate, which was provided to OSD in 1984, only represented acquisition costs. The \$248 million estimate, provided to OSD in 1988, included acquisition costs as well as other development costs. According to Air Force project officials, the comparative acquisition cost figures, which should be used to determine the RDB cost increase, are \$140 million reported in 1984 and \$222 million, which was included in the \$248 cost estimate in 1988. The officials said the \$248 million estimate included \$26 million for modifications and maintenance costs that were not included in the 1984 estimate.

The project's life cycle cost was estimated to be \$375.6 million in the President's Fiscal Year 1990/1991 Information Technology Budget Exhibit with an explanation that the figure was being reassessed. This reassessment is based on guidance provided by the OSD MAISRC after a July 1988 in-process review.

Reasons for Increasing Cost Estimates

Air Force RDB project officials and system justification documents attribute the \$82 million cost increase to changes made in the RDB development approach and acquisition strategy. The first cost increase occurred between January 1985 and June 1986, when the RDB acquisition cost estimate increased \$6.1 million from \$139.6 million to \$145.7 million. The \$6.1 million cost increase, according to RDB system justification documents, can be attributed to the first significant restructure of the RDB project in early 1980 when the Air Force realized that it was infeasible to develop the system all at once.

By September 1988 the Air Force reported that RDB's acquisition cost estimate was increased \$76.5 million from \$145.7 million to \$222.2 million. Air Force project officials and system documents attribute this increase to a lack of detailed requirements, and the contract conversion from a cost-plus-award-fee to a fixed-price contract.

Air Force and OSD Actions to Control Cost

Following the OSD MAISRC's July 1988 in-process review of the Air Force Modernization program, the MAISRC expressed concerns about the Air Force reviews. The specific MAISRC guidance for RDB directed the Air Force to:

- complete a formal review of the RDB project and approve or disapprove the design phase by April 1989;
- provide the results and supporting documentation to the MAISRC Executive Secretary; and
- have the project costs and benefits validated by the Office of the Assistant Secretary of Defense (Program Analysis and Evaluation) by June 1989.

The MAISRC also deferred a decision to revoke the oversight delegation for system development approval of the RDB project, pending a review by the Office of Secretary of Defense (Program Analysis and Evaluation) of the final cost assessment and the Air Force Automated Information Systems Acquisition Review Council documentation.

Contracting Data Management System

According to early system justification documents, the Contracting Data Management System (CDMS) concept originated in the early 1980s to correct contracting data system deficiencies including inefficient data input and difficulties in accessing and managing data. The contracting data systems in use at that time operated in a batch mode and were near capacity. The CDMS project was initiated to replace these systems with an on-line, data base management system. In November 1984, OSD directed the Air Force to determine the practicality of accelerating the CDMS project to provide early capability for users of the proposed system.

In January 1986, the Air Force completed the development of a two-phase acquisition plan. According to project documents, the first phase was an interim effort to enhance several prototype systems. The second phase was to be the major part of the program. Requirements for the second phase were to be defined by an Air Force information engineering study which was designed to provide a long-term solution for improved contracting data management.

By late 1987, the Air Force became concerned that the project requirements identified by the information engineering study could not be met within the current cost and schedule estimates. According to Air Force officials and documentation, the study provided a better understanding of the costs and requirements associated with developing the system. For instance, the study found that the lines of computer code required for the project would increase from 750,000 to 1,200,000 and that system users would need more training than originally estimated.

The current acquisition approach resulted from the additional requirements identified by the information engineering study which was completed in early 1988. The strategy calls for a two-phased approach to be completed March 1994. The first phase of the project will automate the contract production process which will streamline the preparation of acquisition packages, requests for proposals, and contracts. Phase 1 is expected to replace existing systems and comply with Department of Defense standards for data transfer, thus allowing the Air Force to exchange contracting information with other agencies.

Phase 2 will build on phase 1, and is intended to improve management of contracts by prioritizing orders and delivery schedules, providing a current data base of contractor cost data and government approved rates, and consolidating contractor performance data. The Air Force

expects the completed CDMS project to provide \$105 million in benefits from a reduction in personnel and improved contract management.

System Status

The current acquisition cost estimate for CDMS is \$73.8 million, and the Air Force has obligated approximately \$40.1 million to the project. A contract for phase 1 was awarded in September 1986, and project officials expect to award a contract for phase 2 in early 1991. Project officials expect that the system will be fully operational by March 1994, which is more than 3 years later than initial Air Force estimates.

Cost Increases

Following the September 13, 1988, Subcommittee hearing, OSD reported that the CDMS program cost estimate had increased from approximately \$34 million to approximately \$74 million. Air Force documentation showed that both dollar amounts cited by OSD represent acquisition cost estimates. The \$34 million figure is a November 1984 estimate of \$34.4 million and the \$74 million figure is a February 1988 estimate of \$73.8 million.

The Fiscal Year 1990/1991 President's Information Technology Budget Exhibit contained a life cycle cost for CDMS of \$87.4 million. Project officials stated that this estimate, which is being revised, does not include the costs to operate and maintain the system after it becomes fully operational.

Reasons for Increasing Cost Estimates

The CDMS project cost estimates have been significantly increased on two occasions. According to Air Force documentation, CDMS's acquisition cost estimate first increased from \$34.4 million to \$47 million in 1986. Air Force officials stated that the reason for this cost increase was the addition of existing material management and competition advocate automation initiatives to the CDMS project. According to Air Force system justification documents, this was done to consolidate the development of separate acquisition-related projects. An Air Force official pointed out that the initiatives were fully funded and that the funds were added to the CDMS project cost.

The second cost increase to \$73.8 million occurred in February 1988. Air Force documentation attributes the cost growth to a further increase in requirements. According to an Air Force project official, the information engineering study provided a better understanding of the costs and requirements associated with developing the system. As a result of the

information engineering study, the project official is confident that the CDMS project is on track and can be completed on schedule and within the new budget. The project official said that the \$73.8 million acquisition cost estimate is a more accurate estimate now that all of the CDMS requirements are known. The official also stated that steps which are now in place, including cost reporting meetings and briefings, monthly assessments, cost tracking, and weekly contractor reviews, should help control project costs.

Air Force and OSD Actions to Control Cost

As a result of the July 1988 OSD MAISRC review, specific CDMS program guidance was provided to the Air Force. The Air Force Automated Information System Acquisition Review Council was directed to formally revalidate the CDMS concept and development approach. The Air Force was also directed to provide the Office of the Assistant Secretary of Defense, Program Analysis and Evaluation, with an independent cost assessment for CDMS by May 1989. The MAISRC also deferred a decision to revoke Air Force CDMS oversight authority until an in-process review planned for the summer of 1989.

Depot Maintenance Management Information System

The initial Depot Maintenance Management Information System (DMMIS) project proposal evolved in the early 1980s from recognition by the Air Force that existing support systems were not providing accurate and current information. Deficiencies in the existing systems were such that users were not able to gain access to information in a timely manner. In November 1984, the Air Force plan to improve depot management was to develop and integrate three interrelated management information systems; one each for production, financial, and resource management. The estimated cost for the total project was \$85.4 million and full operational capability was expected to be achieved by February 1989.

Two independent studies of the DMMIS project concept, completed in 1985, came to similar conclusions on the practicality of developing three separate systems. The first study by ARINC, Inc., concluded that the requirements were too interrelated to develop the systems separately. The second study completed by Deloitte, Haskins, and Sells suggested that the risks were high for a successful implementation of three separate systems and suggested the use of commercially available manufacturing resource planning software (referred to as MRP II) to implement DMMIS.

To determine whether MRP II could fulfill DMMIS requirements, Deloitte, Haskins, and Sells, with the DMMIS project office, surveyed the Air Force Product Divisions potential users of the system. The results of the survey were that MRP II could satisfy 80 percent of DMMIS requirements and that some modifications and new development would be required to satisfy unique requirements. After the study findings and survey results were briefed to senior-level Air Force management officials, the DMMIS project office was directed to consolidate the separate system development efforts and use the MRP II software.

With this strategy, the Air Force estimated that the DMMIS project would replace 40 data systems and other manual operations. Benefits expected from implementation of the DMMIS project are:

- Increased productivity
- Reduction in labor overtime
- Reduction in inventory costs

The Air Force expected the system's initial operational capability would be achieved by August 1986, and that full operational capability would be achieved by February 1989.

The OSD MAISRC was briefed in February 1986 by the Air Force on the decision to use the MRP II software. The MAISRC was told that the design and development of the system was planned to be accomplished in three phases. Phase I was an interim effort for improved management of the maintenance inventory centers. Phase II was described as incorporating industry accepted manufacturing resources planning concepts for functions such as automated forecasting, inventory control, requirements planning, and shop floor scheduling. Phase II was to be implemented at the Ogden Air Logistics Center. Phase III was described as incrementally implementing the final design at other Air Logistics Centers.

System Status

Since its inception, the DMMIS project has experienced changes and undergone modifications. Originally envisioned to be fully operational by February 1989, the Air Force now plans for DMMIS completion by September 1993. Total acquisition cost estimates now exceed \$242 million. Additionally, Air Force original plans to replace 40 systems with an operational DMMIS, have been modified to replace 25 operational systems.

DMMIS phase I has been accomplished with full operational capability achieved in July 1988. The Air Force estimates that with phase I completed, 15 percent of DMMIS operational capability has been attained. Phases II and III are being developed by Grumman Data Systems, Incorporated under a firm-fixed-price contract that was competitively awarded in January 1988.

Cost Increases

After the September 13, 1988, Subcommittee hearing, OSD reported that the DMMIS cost estimate had increased from approximately \$85 million to \$242 million. The \$85 million figure represents a November 1984 Air Force estimate of DMMIS's acquisition cost and the \$242 million figure is a July 1988 estimate (a \$157 million increase).

The project's life cycle cost estimate was \$273.3 million in the President's Fiscal Year 1990/1991 Information Technology Budget Exhibit. This estimate is being revised, according to Air Force officials, to reflect a more accurate estimate. The revised life cycle cost estimate is expected to be available by mid-1989.

Reasons for Increasing Cost Estimates

Air Force officials and system justification documents attribute the reported \$157 million DMMIS cost increase to poorly defined initial requirements and understated initial cost estimates. The first of two significant increases occurred in March 1987 and brought the baseline cost estimate from \$85.4 million to \$106.1 million. Between October 1985 and March 1987, the Air Force changed the DMMIS development strategy from developing three separate systems to using the MRP II software. According to Air Force briefing documents, the change in development strategy added the requirement for local area network connectivity and increased user training needs. In addition, the Air Force decided to include five other on-going, near term initiatives as part of the DMMIS project. These initiatives were planned and separately funded prior to the establishment of the overall program.

The second significant increase in the DMMIS cost estimate occurred when the Air Force awarded the contract for phases II and III in January 1988. According to Air Force briefing documents, the \$136.3 million increase provided funds for contractor costs associated with the extended schedule and includes additional cost elements such as remote devices, local area network connectivity for remote equipment, site unique modifications requirements, and maintenance.

Air Force and OSD Actions to Control Cost

Following the July 1988 in-process review, the MAISRC decided to revoke the Air Force's approval authority for DMMIS since significant changes in the project's concept, acquisition strategy, cost, and schedule have occurred and the project is pursuing complex development and implementation plans with an aggressive schedule. The MAISRC also directed the Air Force to conduct a revalidation review for the DMMIS project because of concept, cost, and schedule changes.

Objectives, Scope, and Methodology

As a result of a September 13, 1988, hearing by the Subcommittee on Legislation and National Security, House Committee on Government Operations, on the costs and management of the Navy's Standard Automated Financial System, seven other Department of Defense automated information systems were identified as experiencing significant cost growth. Concerned about the cost growth reported by the Defense witness, the Subcommittee Chairman requested that we provide cost and schedule information on the seven systems and report on steps taken by Defense and the military services to control such costs. This report covers the three Air Force systems mentioned in the Chairman's letter—the Requirements Data Bank, the Contracting Data Management System, and the Depot Maintenance Management Information System. The other four systems identified during the hearing are addressed in separate reports.

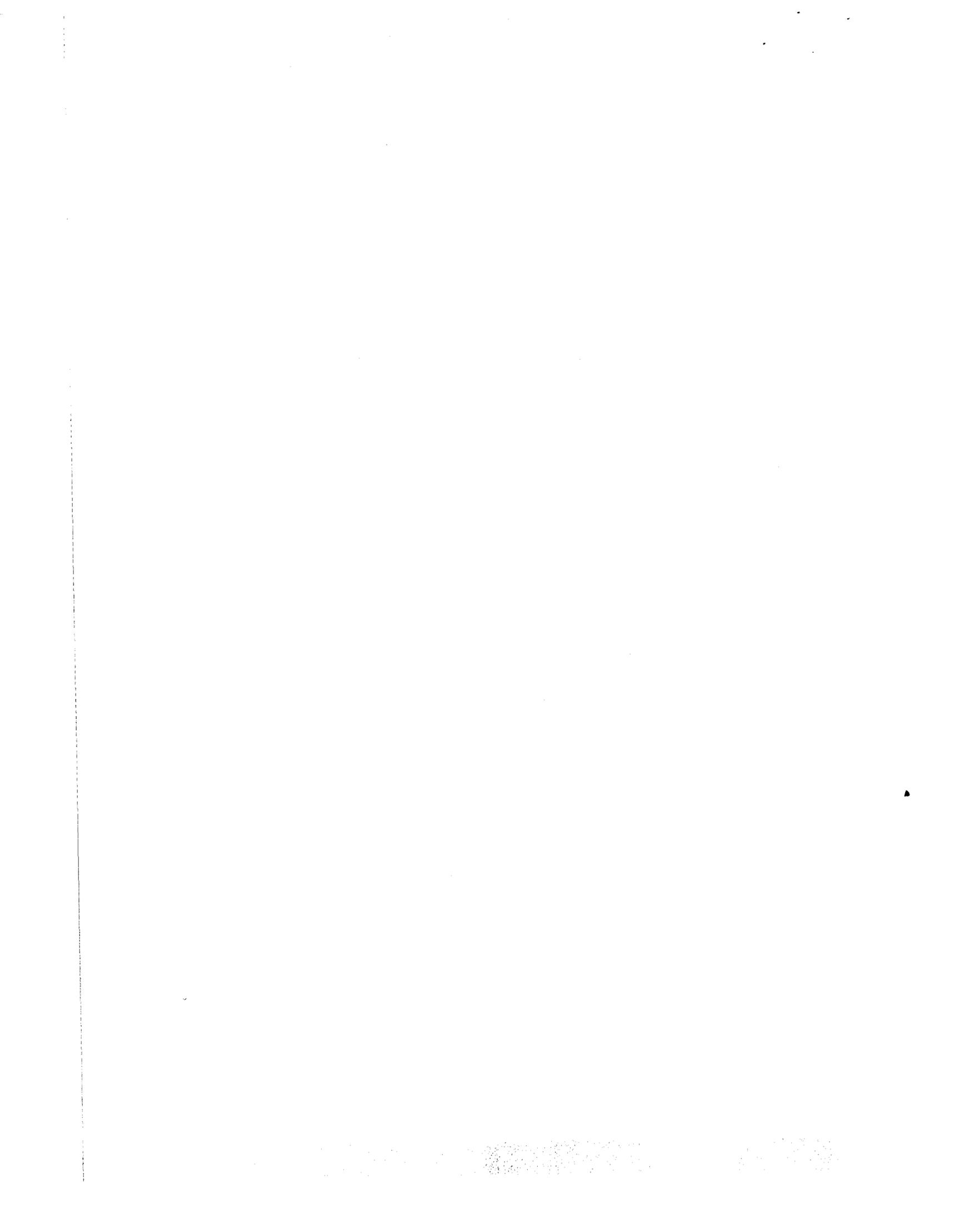
We interviewed the project manager for each Air Force system and other Air Force officials responsible for program management and budget development. We also interviewed Office of the Secretary of Defense officials having system oversight and approval roles. We reviewed internal Defense and Air Force reports on the projects, system life cycle management documentation, contract documents, and relevant budget documents. We also reviewed applicable Defense and Air Force directives and instructions governing information system acquisitions. Our work did not include an independent assessment of the accuracy of the Air Force cost estimates for the projects or the reasons provided by the Air Force and OSD officials for any cost increases or decreases.

We performed our work between October 1988 and February 1989 at the project management offices located at Wright-Patterson Air Force Base, Ohio, and at Defense offices located in the Pentagon. The facts in this report have been discussed with both Air Force and Defense officials. While we did not obtain official agency comments on this report, comments of responsible Defense and Air Force officials have been incorporated where appropriate.

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